Varian 900-LC Series Liquid Chromatograph

Getting Started Manual

Installation Category II
Pollution Degree 2
Safety Class 1 (EN 61010-1)

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CE

Declaration of Conformity

We hereby declare that the equipment listed below complies with the requirements of:
The Low Voltage Directive 73/23/EEC (93/68/EEC)
The EMC Directive 89/336/EEC (92/31/EEC and 93/68/EEC)

Applicable Standards

LVD	BS EN 61010-1:2001		
EMC	EN 61326:2003	EN 55011:1998	EN 61000-3-11:2000
	EN 61000-4-2:1995	EN 61000-4-3:1995	EN 61000-4-4:1995
	EN 61000-4-5:1995	EN 61000-4-6:1996	EN 61000-4-11:1994

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Safety Practices and Hazards

Your Varian instrument and accessories have been carefully designed so that when used properly you have an accurate, fast, flexible and safe HPLC system.

Information about safety practices appears throughout the documentation (both hard copy and online) provided with your instrument. Before using the instrument, you must thoroughly read these safety practices.

Observe all relevant safety practices at all times.

This instrument is designed for chromatographic analysis of appropriately prepared samples. It must be operated using appropriate solvents and within specified maximum ranges for pressure, flows, and temperatures as described in this manual. If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

It is your responsibility to inform Varian representatives if the instrument has been used for the analysis of hazardous biological, radioactive, or toxic samples, prior to any instrument service being performed or when an instrument is being returned to the service center for repair, or is being recycled at end-of-life.

General

Operation of a Varian 900-LC Series Liquid Chromatograph involves the use of pressurized liquid, ultraviolet radiation, and hazardous materials including corrosive fluids and flammable liquids. Careless, improper or unskilled use of this liquid chromatograph can cause death or serious injury to personnel, and/or severe damage to equipment and property.

The 900-LC Series Liquid Chromatograph incorporates covers that are designed to prevent inadvertent contact with any potential hazards. If the instrument is used in any manner not specified by Varian, this protection may be impaired. It is essential that no cover is bypassed, damaged or removed.

The safety practices described below are provided to help the user operate the instrument safely. Read each safety topic thoroughly before attempting to operate the instrument and ALWAYS operate the liquid chromatograph in accordance with these safety practices.

Follow these safety practices to ensure safe equipment operation.

- Perform periodic leak checks on all supply lines and pneumatic plumbing.
- Do not allow liquid lines to become kinked or punctured. Place lines away from foot traffic and extreme heat or cold or ignition sources.
- Store organic solvents in fireproof, vented and clearly labeled cabinets so they are easily identified as toxic and/or flammable materials.
- Keep the waste vessel in view and empty as required.
- Do not accumulate waste solvents. Dispose of such materials through a regulated disposal program and not through municipal sewage lines.

This instrument has been tested per applicable requirements of EMC Directive as required to carry the European Union CE Marking. This equipment may be susceptible to radiation/interference levels or frequencies, which are not within the tested limits.

Electrical Hazards

Exposure to high voltages and UV energy can cause severe skin damage and cataracts of the eyes, while close contact with the electrical components can result in severe heat burns to the skin, and an electrical discharge which may cause death, severe electric shock or sub-surface skin burns.

The 900-LC Series Liquid Chromatograph has been carefully designed to operate safely and effectively when using components that conform to Varian's design criteria. Use of non-approved components in the HPLC system may render the system inoperative and/or hazardous. It may also invalidate the warranty on the instrument. Use only related components supplied or authorized by Varian.

- Disconnect the instrument from all power sources before removing protective panels to avoid exposure to potentially dangerous voltages. Panels or covers which are retained by screws on the HPLC system may be opened ONLY by Varian-trained, Varian-qualified, or Varian-approved Representatives.

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Consult the manuals or product labels supplied with your PC to determine which parts are operator-accessible.

- When it is necessary to use a non-original power cord plug, make sure the replacement cord adheres to the color coding and polarity described in the manual and all local building safety codes.
- Good grounding/earthing is essential to avoid a potentially serious electric shock hazard. Consult the manuals or product labels supplied with your PC for the relevant grounding requirements.
- Replace blown fuses with fuses of the size and rating shown on the fuse panel or in the manual.
- Replace faulty or frayed power cords immediately with the same type and rating.
- Make sure that voltage sources and line voltage match the value for which the instrument is wired.
- Avoid using power supplies from a source that may be subject to electrical or RF interface from other services (for example, large electrical motors, elevators and welders).

Compressed Gas Cylinders

Unless your system is equipped with a helium sparging unit or an ELS detector, there are no gas requirements for the 900-LC Series HPLC systems. For gas requirements on these devices, consult the Operation Manual or other documentation enclosed with the particular device. Compressed gas cylinders contain highly pressurized gas. If storage conditions are outside of the recommended suppliers safety codes the cylinders can explode or rapidly release gas into the environment. This may result in injury or death.

- Store and handle compressed gases carefully and in strict adherence to safety codes.
- Secure cylinders to an immovable structure or wall.
- Store and move cylinders in an upright, vertical position. Before transport, remove regulators and install cylinder cap.
- Store cylinders in a well ventilated area away from heat, direct sunshine, freezing temperatures, and ignition sources.
- Mark cylinders clearly so there is no doubt as to their contents.
- Use only approved regulators and connections.

- Use only connector tubing that is chromatographically clean (Varian part number 0391832600) and has a pressure rating significantly greater than the highest outlet pressure from the regulator.

Storage Cylinder Instructions

Cylinders containing gas under pressure should be firmly secured to a rigid structure, and the storage area must be adequately ventilated.

Never locate gas cylinders near a source of ignition, or in a position that is subject to direct heat. Gas storage cylinders often incorporate a pressure release device which will discharge the gas at a predetermined temperature, usually around 52 °C (125 °F).

If gases are to be plumbed from a remote storage area to the instrument site, ensure that the local outlets are fitted with stop valves, pressure gauges and suitable regulators which are easily accessible to the instrument operator. The gas outlets must be provided within 1.5 metres (5 feet) of the instrument.

High Pressure Hazards

If a line ruptures, a relief device opens, or a valve opens accidentally under pressure, potentially hazardous high liquid pressures can be generated by the pump causing a high velocity stream of volatile and/or toxic liquids.

- Wear personal protective equipment when you inject samples or perform routine maintenance.
- Never open a solvent line or valve under pressure. Stop the pump first and let the pressure drop to zero.
- Read and adhere to all NOTES, CAUTIONS, and WARNINGS in the manual.
- Always keep the doors and covers closed during operation.

Ultraviolet Radiation

900-LC Series Liquid Chromatograph systems that use an ultraviolet light source have shielding to prevent radiation exposure to personnel.

For continued protection:

- Ensure that any protective lamp covers are in place during operation.

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- Do not look directly into detector fluid cells or at the UV light source. When inspecting the light source or fluid cell, always use protective eye covering such as borosilicate glass or polystyrene.
- Ozone can be generated by radiation from source lamps. Exposure to ozone can result in severe irritation to the skin, eyes, and upper respiratory system. The maximum permissible exposure level is 0.1 ppm (0.2 mg/m^3). ALWAYS ventilate the area surrounding the HPLC system such that the concentration of ozone does not exceed the maximum permissible level. All venting must be to outside air, never within the building.

Solvent Hazards

The operator should be familiar with the physico-chemical properties of the components of the mobile phase.

Only use solvents compatible with the HPLC system tubing and fittings as certain solvents may cause weakening and leaks with possible bursting.

Employ static measuring and static discharge devices to safeguard against the buildup of static electricity.

All solvents can create a hazard if they leak into the atmosphere. Even small leaks in solvent supply systems can be dangerous. Any leak (except that of air) can result in an oxygen-deficient atmosphere, which can cause asphyxiation. The area in which solvents are stored and the area surrounding the instrument must be adequately ventilated to prevent such accumulations.

Ignition of Flammable Chemicals

This instrument is not explosion-proof. In unattended operation, do not use organic solvents having an ignition point below 70 °C.

If a flammable chemical such as organic solvent leaks from the flow path of the instrument and its vapor concentration reaches the explosion limit, it could cause spontaneous combustion with dangerously explosive results.

Beware of ignition hazard when using flammable chemicals such as organic solvents.

Do not bring a heat or flame source near the instrument.

Ventilate the laboratory room where the instrument is used.

Always check the following conditions. If an abnormality is found, stop operation immediately.

- Leakage of solvent or waste solution.

- Leakage of solvent inside the instrument.

When using flammable chemicals, be careful about possible ignition due to static electricity. To prevent the build-up of static electricity, use a conductive container for waste.

Use only approved regulator and hose connectors (refer to the supplier's instructions). Keep solvents cool and properly labeled. Ensure that you have the correct solvent before connecting it to the instrument.

Inflammation or Injury Due to Toxic, Corrosive or Stimulative Solvent

When using a toxic, corrosive or stimulative solvent, be careful not to contact solvent to prevent physical inflammation or injury. For details of the properties of each solvent and how to handle it, refer to the relevant Material Safety Data Sheets (MSDS). Be sure to handle each solvent properly.

Wear proper personal protective clothes (e.g., safety goggles) so that a solvent will not come into direct contact with the skin.

Ventilate the laboratory room adequately to prevent accidental inhalation of harmful solvent vapor.

Other Precautions

Use of the 900-LC Series Liquid Chromatograph and accessories may involve materials, solvents and solutions, which are flammable, corrosive, toxic or otherwise hazardous. Careless, improper or unskilled use of such materials, solvents and solutions can create explosion hazards, fire hazards, toxicity and other hazards that can result in death, serious personal injury or damage to equipment.

Always ensure that laboratory safety practices governing the use, handling and disposal of hazardous materials are strictly observed. These safety practices should include wearing appropriate safety clothing and safety glasses.

Airflow to the cooling fans of the liquid chromatograph must be unobstructed. Do not block the ventilation grills on the liquid chromatograph and accessories. Consult the manuals supplied with your PC, monitor and for their specific ventilation requirements.

Great care should be taken when working with glass or quartz parts to prevent breakage and cuts.

The 900-LC Series Liquid Chromatograph weighs approximately 130 kg (287 lb). To avoid injury to personnel or damage to the instrument or property, always use appropriate lifting procedures to move the instrument.

Use only Varian-supplied spares with your instrument.

Warning and Caution Messages

A Warning message is used in the text when failure to observe instructions or precautions could result in death or injury. The list of symbols that appear in conjunction with warnings are detailed in the next section.

A Caution message is used when failure to observe instructions could result in damage to equipment (Varian supplied and/or other associated equipment).

Warning Symbols

The following is a list of symbols that appear in conjunction with warnings in this manual or on the 900-LC Series Liquid Chromatograph. The hazard they describe is also shown.

A triangular symbol indicates a warning. The meanings of the symbols that may appear alongside warnings in the documentation or on the instrument itself are as follows:

Corrosive liquid

Electrical shock

Explosion hazard

Eye hazard

Fire hazard

Heavy weight (danger to feet)

Heavy weight (danger to hands)

Hot surface

Moving parts

Radiation source

The following symbol may be used on warning labels attached to the instrument. When you see this symbol, refer to the relevant operation or service manual for the correct procedure referred to by that warning label.

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The following symbols appear on the instrument for your information.

	Mains power on/off button. Press the power button in and release it to turn it on. Press the power button in for 5 seconds and then release it to turn the HPLC system off. There may be a short delay between releasing the power button and instrument shut down.
	Fuse
	Single phase alternating current
	Direct current
	When attached to the rear of the instrument, indicates that the product complies with the requirements of one or more EU directives.
	When attached to the rear of the product, indicates that the product has been certified (evaluated) to CSA 1010.1 and UL 3101-1.

Color Coding

The various indicator lights appearing on Varian instruments and associated accessories are color coded to represent the status of the instrument or accessory.

- A green light indicates the instrument is in normal/standby mode.
- An orange light indicates that a potential hazard is present.
- A blue light indicates that operator intervention is required.
- A red light may warn of danger or an emergency.

US FCC Advisory Statement

This equipment generates, uses and can radiate radio frequency energy, and if not installed and operated in accordance with the instruction manual may cause interference to radio communications. It has been tested and found to comply with the limits for a Class A computing device pursuant to Subpart J of Part 15 of Federal Communications Commission (FCC) Rules, which are designed to provide reasonable protection against such interference when operated in a commercial environment.

Operation of this equipment in a residential area may cause interference, in which case the user will be required to take whatever measures may be necessary to correct the interference at his or her expense.

Spurious and Harmonic Radiation Compliance

Your Varian 900-LC Series Liquid Chromatograph complies with the requirements of FCC rules and Regulations part 18, subpart H—Miscellaneous Equipment, at the date of manufacture.

CE Compliance

Your Varian 900-LC Series Liquid Chromatograph has been designed to comply with the requirements of the Electromagnetic Compatibility (EMC) Directive and the Low Voltage (electrical safety) Directive (commonly referred to as the LVD) of the European Union. Varian has confirmed that each product complies with the relevant Directives by testing a prototype against the prescribed EN (European Norm) standards.

Proof that a product complies with these directives is indicated by:

- The CE Marking appearing on the rear of the product, and
- The documentation package that accompanies the product containing a copy of the Declaration of Conformity. The Declaration of Conformity is the legal declaration by Varian that the product complies with the directives listed above, and shows the EN standards to which the product was tested to demonstrate compliance. It is also signed by Varian's Authorized Representative in the EU, and by the representative of the manufacturing plant.

1. Introduction

1.1 Pre-installation Requirements

Prior to receiving your instrument, you will have been provided with a 900-LC Series Liquid Chromatograph Pre-installation Manual (publication number 8510243900), which describes the environmental and operating requirements of the HPLC system. You must prepare your laboratory according to these instructions before the HPLC system can be installed. You should keep the pre-installation manual for future reference. If you have misplaced your copy, you can obtain a free replacement from your local Varian office. Alternatively, download a PDF from the Varian, Inc. Web site, www.varianinc.com

1.2 User Documentation

You have been provided with the following documentation to help you set up and operate your Varian 900-LC Series Liquid Chromatograph:

- This Getting Started manual, with safety practices and hazards information, where to find information about installing and maintaining instrument components and a brief operation overview.
- An extensive online Help system containing context-sensitive help, step-by-step instructions for frequently performed operations and instructions for using any accessories you ordered.

1.2.1 Conventions

The following conventions have been used throughout the documentation:

- Menus, menu options and field names (e.g. select **Copy** from the **Edit** menu) have been typed in bold. Bold is also used to

signify the pushbuttons appearing throughout the software (e.g. click **OK**).

- ALL CAPITALS indicate keyboard and mouse commands (e.g. press the F2 key) and text you must type in from the keyboard (e.g. type SETUP at the prompt).

1.2.2 Notes and Hot Tips

A Note is used to give advice or information. A Note is denoted by the following symbol: ➾

A Hot Tip is used to give practical hints to help you achieve the best possible performance from your instrument. A Hot Tip is denoted by the following symbol: ☆☆☆

1.3 Specifications

The instrument is suitable for indoor use **only** and is classified suitable under the following categories (EN 61010-1):

Installation category II
Pollution degree 2
Safety class 1

1.3.1 Environmental Conditions

Condition	**Altitude**	**Temp (°C)**	**Humidity (%RH) non-condensing**
Non-operating (Transport)	0–3 050 m (0–10 000 ft)	5–45	20–80
Non-operating & meeting dielectric strength tests	Sea level	40	90–95
Operating within specifications	0–2 000 m (0–6 560 ft)	10–35	8–80

Table 1. *Environmental conditions*

➾ **Note** For **optimum analytical performance**, it is recommended that the ambient temperature of the laboratory be between **20 and 25 °C** and be held constant to within ±2 °C throughout the entire working day.

1.3.2 Electrical Power Supplies

All power supplies should be single phase AC, 3 wire system (active, neutral, ground or two active and ground) and should be terminated at an appropriate connection receptacle that is within reach of the system power cable.

1.3.2.1 900-LC Series HPLC System Power Connections

Power supply phase	Single
Power supply, current rating and overload protection	Between 3 and 5 A (for 220-240 V countries) Between 6 and 12 A (for 100-120 V countries)

	Plug supplied	**Required wall socket**
Australia	Complies with AS3112	To comply with AS3112 HPM 787 or Clipsal 2015 (250 V, 10 A)
USA	Complies with Nema 5-15P	To comply with Nema 5-15R Hubbell 5262 (125 V, 15 A)
Canada	Complies with Nema 5-15P Complies with CS 22.2 No. 42	To comply with Nema 5-15R Hubbell 5262 (125 V, 15 A)
Europe	Complies with CEE 7 Sheet VII	To comply with CEE 7 Sheet VII (250 V, 10/16 A)

Table 2. *Power connections*

1.3.2.2 Fuses

1FS1 & 1FS2	T10 A H250 V, 3AB SLO-BLO (for 220-240 V countries) T20 A H250 V, 3AB SLO-BLO (for 100-120 V countries)
FS3	T2.5 A H250 V, 5x20 mm (for both 100-120 V and 220-240 V countries)

Table 3. *Fuses*

Note For safety reasons, any other internal fuses or circuit breakers are not operator accessible, and should only be replaced by Varian-authorized personnel.

Fuse information on the rear of the instrument is the most up to date.

1.3.2.3 Electrical Requirements

The installation of electrical power supplies must comply with the rules and/or regulations imposed by the local authorities responsible for the use of electrical energy in the workplace.

All power supplies for the 900-LC Series Liquid Chromatograph and accessories should be single phase, AC, 3 wire systems (active, neutral, ground or two active and ground). Each connection should be terminated at an appropriate receptacle within reach of each assembly's power cable. Use of power boards or extension cables is **not** recommended**.**

Avoid using power supplies from a source that may be subject to electrical interference from other services (such as large electric motors, elevators, centrifuges and air conditioning units). The Varian 900-LC Series Liquid Chromatographs are supplied with a 2 meter long (6 ft 6 in), mains supply cable.

System unit	Required supply voltage	Nominal rating
920-LC Analytical Liquid Chromatograph	100-120, 220-240 V AC, 50-60 Hz	1000 VA
940-LC Semi-Preparative Liquid Chromatograph	100-120, 220-240 V AC, 50-60 Hz	800 VA
940-LC Preparative Liquid Chromatograph	100-120, 220-240 V AC, 50-60 Hz	1200 VA
Fraction Collector	115-230 V AC, 50-60 Hz	264 VA
External ELS Detector	115-230 V AC, 50-60 Hz	480 VA
External RI Detector	115-230 V AC, 50-60 Hz	150 VA
Ethernet Switch	115, 220 or 240 V AC, 50-60 Hz	7 VA
Personal computer (Typical)	115, 120, 220, 240 VAC	300 VA
Printer (Typical)	115, 120, 220, 240 VAC	85 VA

Table 4. *Power requirements*

1.3.3 Gas Supplies

The installation of compressed or liquid gas supplies must comply with the rules and/or regulations imposed by the local authorities responsible for such use in the workplace.

The main gas supply requirement is nitrogen for supply to ELS Detector. Nitrogen from a cylinder or nitrogen generator may be used with Varian 900-LC Series Liquid Chromatograph ELS Detector.

	Nitrogen Gas
Purity	>98% filtered to 0.2 μm
Permissible pressure range	60 to 100 psi (4–6.7 bar)
Maximum pressure	100 psi (6.7 bar) regulated
Required flow rates	Up to 3.25 L/min at 60 psi at 25 °C

Table 5. *Gas requirements*

Helium may also be required to if you are using a helium sparging system to degas solvents. Consult the documentation that came with your helium sparging system for gas requirements.

1.3.3.1 Storage Cylinder Instructions

Cylinders containing gas under pressure should be firmly secured to a rigid structure, and the storage area must be adequately ventilated.

Never locate gas cylinders near a source of ignition, or in a position that is subject to direct heat. Gas storage cylinders often incorporate a pressure release device which will discharge the gas at a predetermined temperature, usually around 52 °C (125 °F).

If gases are to be plumbed from a remote storage area to the instrument site, ensure that the local outlets are fitted with stop valves, pressure gauges and suitable regulators which are easily accessible to the instrument operator. The gas outlets must be provided within 1.5 meters (5 feet) of the instrument.

1.3.4 Waste Container

The Varian 900-LC Series Liquid Chromatograph needs a drain vessel for disposal of fluids and vapors from the system. Suitable tubing is supplied with the HPLC system for use with most HPLC solvents. Always check that your HPLC system tubing is compatible with your solvents.

A chemically inert container, not glass and not sealed, to hold a minimum of 2 liters (4 pints) of waste must be provided by the user. Narrow necked containers are preferred. The waste vessel(s) should be bonded. It should be placed where it is protected by the bench and in full view of the operator.

1.3.5 Laboratory Conditions

The area selected for the operation of a Varian HPLC system **must be free from drafts, corrosive atmospheres and vibration.** Sample preparation areas and materials storage facilities should be located in a separate room.

The area should be a dust-free, low humidity environment. Air-conditioning is strongly recommended for control of the environment. For optimum analytical performance it is recommended that the ambient temperature of the laboratory is between 20 and 25 °C (68 and 77 °F).

1.3.6 Instrument Cooling Air Supply

Air is drawn from the front of the instrument and out the back to cool the electronics of the instrument. Several of these assemblies contain parts prone to corrosion. The introduction of cooling air contaminated with high levels of acid, vapors or other corrosive substances may cause damage to the instrument.

Due to the corrosive nature of some work, it is recommended that in applications demanding high usage of corrosive materials, an external cooling air supply system is provided. It is recommended that the cooling air be supplied from an environmentally controlled area that is away from the instrument exhaust and any other area where corrosive materials are stored or used.

1.3.7 Weights and Dimensions

System Unit	**Width**	**Depth**	**Height**	**Weight**
Varian 920-LC Analytical Liquid Chromatograph	750 mm 30 in	725 mm 29 in	665 mm 27 in	115 kg 254 lb
Varian 940-LC Semi-Preparative Liquid Chromatograph	750 mm 30 in	725 mm 29 in	665 mm 27 in	125 kg 276 lb
Varian 940-LC Semi-Preparative Liquid Chromatograph with Scale Up Module	750 mm 30 in	725 mm 29 in	856 mm 34 in	130 kg 287 lb
Varian 940-LC Preparative Liquid Chromatograph	750 mm 30 in	725 mm 29 in	665 mm 27 in	115 kg 254 lb
Shipping dimensions for all HPLC systems	950 mm 38 in	895 mm 36 in	1165 mm 46 in	170 kg 375 lb

Computer and Printer				
Computer (typical)	450 mm 18 in	770 mm 30 in	520 mm 20 in	(n/a)
Laser printer (typical)	500 mm 18 in	650 mm 30 in	200 mm 20 in	(n/a)

External Options/Devices				
Fraction Collector	400 mm 16 in	600 mm 24 in	480 mm 19 in	18 kg 34 lb
Shipping dimensions	760 mm 30 in	500 mm 20 in	600 mm 24 in	31 kg 69 lb
Refractive Index Detector	296 mm 12 in	385 mm 15 in	212 mm 9 in	11 kg 25 lb
Shipping dimensions	775 mm 31 in	475 mm 19 in	460 mm 18 in	14 kg 31 lb
ELS Detector	200 mm 8 in	360 mm 14 in	415 mm 17 in	11 kg 25 lb
Shipping dimensions	700 mm 28 in	450 mm 18 in	600 mm 24 in	18 kg 40 lb

Table 6. *900-LC Series Liquid Chromatograph and options dimensions*

Warning
The HPLC system weighs up to 130 kg (287 lb). To avoid injury to personnel or damage to equipment, always use a forklift or other suitable lifting device when moving the instrument.

1.4 Personal Computer Requirements

The recommended and minimum PC specifications are listed in the following table. They can also be found on Varian's Web site at www.varianinc.com. The minimum configuration represents the absolute minimum that is required to run the Galaxie™ software. This PC configuration may be out of manufacture, but you may

want to use a PC you already have. The recommended configuration should be followed when buying a new PC.

Minimum	**Recommended**
Pentium 4 processor, 2.8 GHz or higher	Core 2 Duo, 2.13 GHz or higher
1 GB of RAM	2 GB of RAM
160 GB hard drive	2 x 200 GB hard drives
16 speed CD-ROM or DVD-RW	16 speed CD-ROM or DVD-RW
Super VGA monitor with high color (16 bit) display, 1024 x 768 resolution, minimum 17” monitor	Super VGA monitor with high color (16 bit) display, 1024 x 768 resolution, minimum 17” monitor
16 bit sound card	16 bit sound card
Windows® compatible keyboard	Windows® compatible keyboard
Microsoft® or compatible mouse	Microsoft® or compatible mouse
Two PCI-compatible slot for I/O card	Two PCI-compatible slot for I/O card
Windows® XP SP 1	Windows® XP SP 1
Microsoft® Internet Explorer® v6.0	Microsoft® Internet Explorer® v6.0

Table 7. *Recommended PC specifications*

*For Galaxie™ CDS server specifications please contact your local Varian sales representative.

PCs supplied with Letter of Credit orders will be an international brand and will be the ‘Recommended’ configuration or better.

Higher rated PC components can be substituted for those listed above e.g., processor type, amount of memory, screen size and resolution, operating system version etc.

For the latest PC and video card recommendations please see the Varian, Inc. website at www.varianinc.com

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2. Installation

The Varian 900-LC Series Liquid Chromatograph must be installed by a Varian-trained, Varian-qualified or Varian-authorized representative.

You should have completed and returned the form in the pre-installation manual stating that you have prepared the laboratory in accordance with the requirements detailed in that manual. A Varian representative will then arrange a suitable installation date with you.

Details for unpacking the instrument and what to do in case it has been damaged in transit are also outlined in the pre-installation manual.

Basic installation involves:

- Setting up the HPLC system to PC communications
- Installing the Galaxie™ software
- Installing the Driver and Online Help
- Installing the hardware
- Running the system test
- Basic customer training

2.1 900-LC Series HPLC System to PC Communications

The company network must allow TCP/IP communications between the client, acquisition server and HPLC systems. However a desktop switch is provided with the instrument, to allow local networking. The following are suggested network connections using the provided switch.

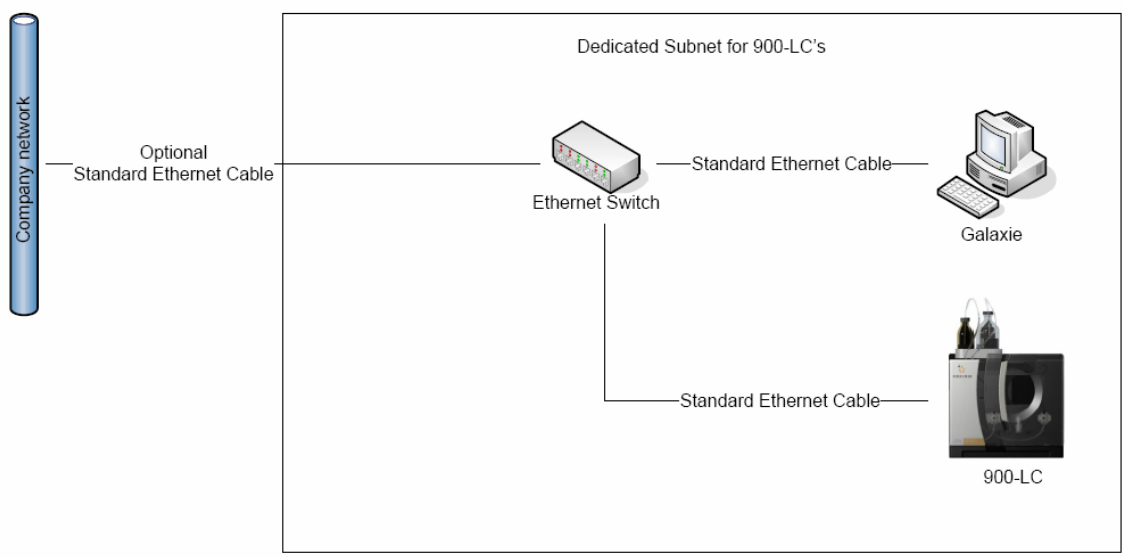

Figure 1. *Single 900-LC Series HPLC System in standalone configuration with network connection*

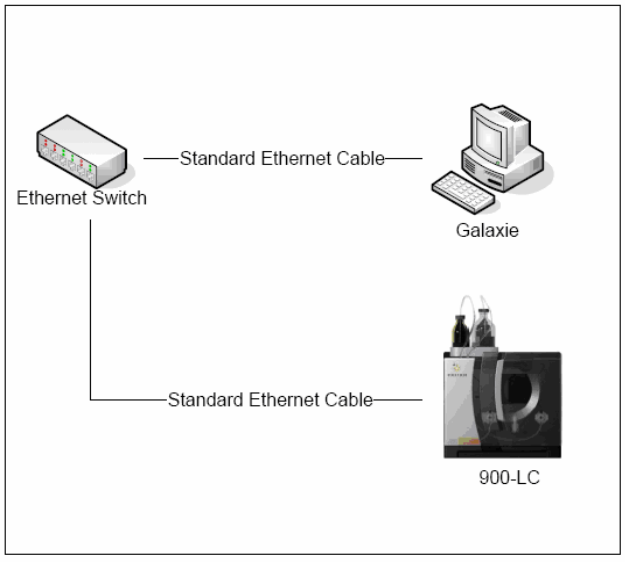

Figure 2. *Single 900-LC Series HPLC System in standalone configuration with no network connection. You must use a static IP address in this configuration.*

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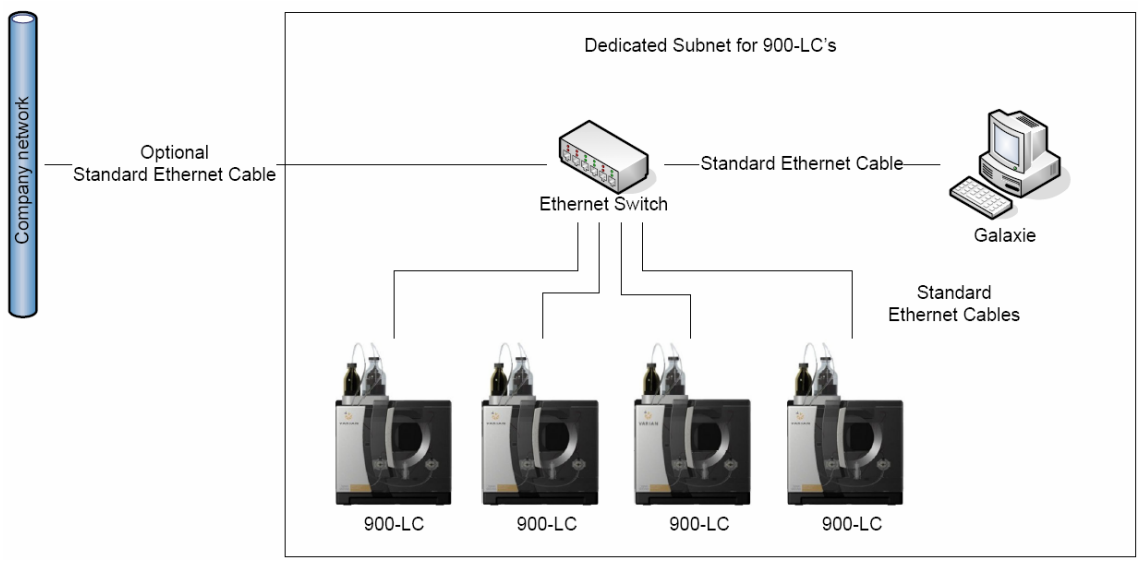

Figure 3. *Multiple 900-LC Series HPLC Systems in standalone configuration*

Up to four systems can be controlled by one Galaxie Acquisition Server. For a client server system there will need to be a PC with the Galaxie Acquisition Server running for every four HPLC systems.

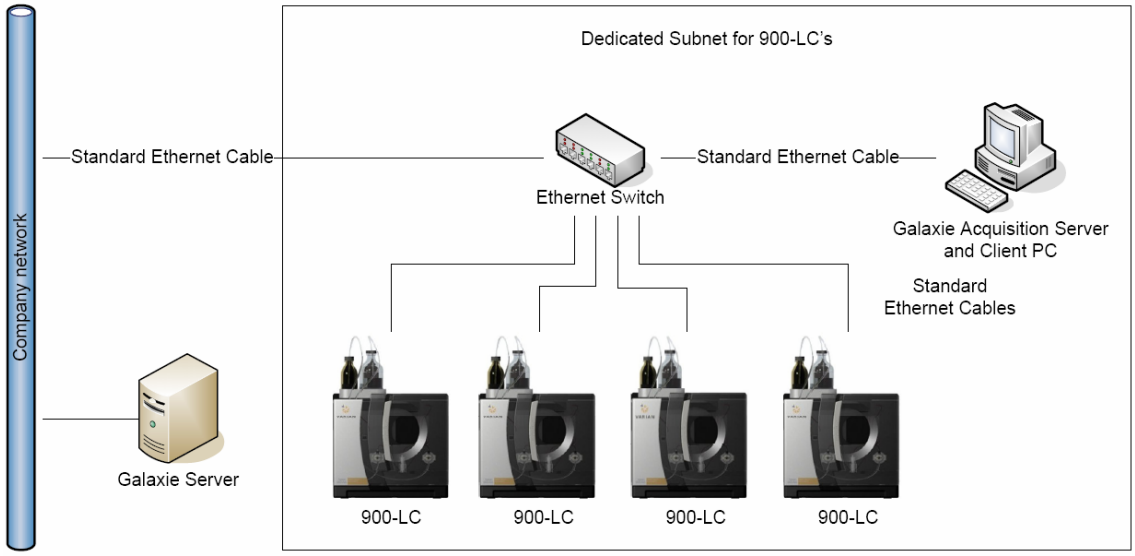

Figure 4. *Networked multiple 900-LC Series HPLC System configuration option 1*

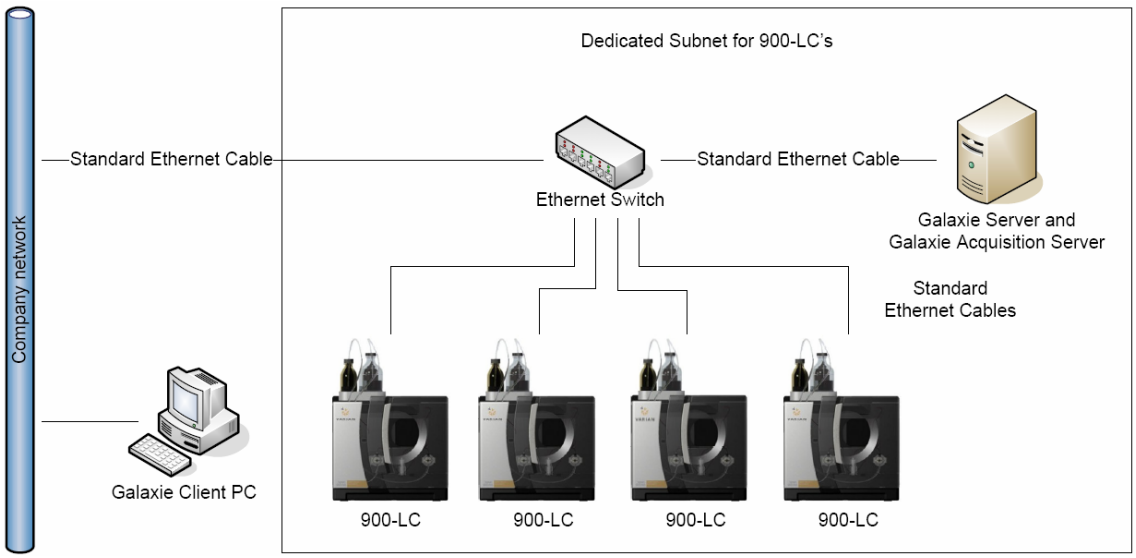

Figure 5. *Networked multiple 900-LC Series HPLC System configuration option 2*

You or your network administrator must provide any hardware, adapters, cables, and configuration and setup work required to convert from the company network wiring type to 10/100 BaseT wiring. This hardware must comply with the IEEE 802.3 standard.

Choose the appropriate set up for your laboratory. Use standard Ethernet cables. Your 900-LC Series HPLC system comes with two Ethernet cables and a network switch. You will need to provide additional cables based on your HPLC system and PC configuration.

To connect the Ethernet cables:

Note You must connect the 900-LC Series HPLC system to the PC running the Galaxie Acquisition server via the network switch provided. This will ensure uninterrupted connection between these two devices.

1. Connect an Ethernet cable from the Network/PC port on the side of the 900-LC Series HPLC system to the provided Ethernet switch. Consult the instructions provided with the switch for more information.

Figure 6. Side of 900-LC Series HPLC. This image has been

rotated to show horizontal. The connections are vertical on the side of the HPLC system.

2. Connect an Ethernet cable from the Ethernet switch to the Ethernet port on the PC(s) and/or company network.
3. Connect the switch to your company network if required.

2.2 Installing the Galaxie™ Chromatography Data System Software

Varian recommends that you purchase a PC as part of the Varian 900-LC Series Liquid Chromatograph package. The PC included in the package will come with the appropriate Windows™ operating system as loaded by the PC supplier.

For instructions on installing the Windows® operating system, please refer to the appropriate manuals supplied with the software. It is your responsibility to ensure that the operating system software has been installed and is functional if you are supplying the PC or the operating system.

Note It is important to set up user profiles with permissions to access the Galaxie software on each PC used with the 900-LC Series HPLC and a user profile for the administrator to have access to the Galaxie Configuration Manager.

The 900-LC Series HPLC system requires Galaxie software version 1.9 SP1 or greater, a serial number for either the Galaxie Varian HPLC Drivers or the Varian 900-LC Series Driver and the 900-LC Series Driver software. If you do not have Galaxie Software version 1.9 SP1 or greater, you must upgrade to run the 900-LC Series driver.

Note Varian will not assume responsibility for loss of data.

Your Varian representative will connect the PC to the HPLC system and any factory-approved accessories purchased at installation. Initial instrument software installation is also included as part of the system installation.

Although the Varian-trained, Varian-qualified or Varian-authorized representative will install the Galaxie™ software for you during the installation process, you may need to install the software yourself at some later stage, for example if you change the PC.

2.2.1 Software Components Requiring Installation and Serial Numbers Used During Installation

The table below shows which components may need to be installed during the installation process and which serial numbers

you will need to use.

	New Galaxie Data Chromatography software and new 900-LC Series HPLC driver	**Existing Galaxie CDS, existing Varian HPLC driver and new Varian 900-LC driver**	**New Galaxie CDS, new Varian HPLC driver and new Varian 900-LC driver**
Galaxie CDS	X	X*	X
Galaxie Varian 900-LC Driver	X (p/n 8510244200)	N/A	X
Galaxie Varian HPLC Driver	N/A	X This serial number is used during the installation of the new 900-LC driver. (p/n 0395000491)	X** This serial number is used twice during the installation of both the Varian HPLC driver and the 900-LC driver. (p/n 0395000491)

Table 8. *Software installation requirements and serial numbers*

*Additional instrument licenses may need to be purchased to run both an existing Varian HPLC and Varian 900-LC instrument at the same time. Please contact your local Varian representative for more information. Galaxie CDS will need to be installed if a new client, acquisition or server is to be used.

**If you are installing both the Varian HPLC driver and the Varian 900-LC driver on the same acquisition server, the same serial number will need to be entered twice, both when installing Varian HPLC Drivers and when installing the 900-LC Series driver. You will only need to purchase the one serial number. For subsequent installs, the serial number is recognized.

2.2.2 Galaxie CDS Client/Server Installation Information

There are three different components in a Galaxie CDS client/server installation. The three components can be installed on separate PCs or combined on the one PC. (See the Galaxie Installation manual for more information.)

- Main server – where data and methods are stored. Configure only one main server when installing the Galaxie CDS software.

- Acquisition server – communicates with the hardware of the 900-LC Series HPLC system. Up to four 900-LC systems can be run by one acquisition server. There can be several acquisition servers in a Galaxie CDS installation.
- Client – methods are created, data viewed and reprocessed. There can be several clients in a Galaxie CDS installation.

Note The 900-LC Series driver must be installed on all PCs in the Galaxie network regardless of whether it is a main server, acquisition server, or client PC. System configuration should only be done on the acquisition server when using the 900-LC Series driver setup wizard. The online help must be installed on every PC where it may need to be viewed.

2.2.3 Galaxie Workstation Stand-alone Installation Information

When using a stand-alone configuration the software for the main server, acquisition server and client are installed on one PC. This PC can then be used to control up to four 900-LC Series HPLC systems.

2.2.4 Galaxie Installation Procedure

The 900-LC Series Driver installation has several steps:

1. Install the Galaxie core software.

   See the Galaxie Chromatography Data System Installation manual for instructions to install the software and configure user permissions.

2. Install other HPLC or GC drivers as required.

   This step is part of the Galaxie core installation.

3. Install the 900-LC Series HPLC driver.

   The installation software for the 900-LC Series HPLC driver is a separate CD to the Galaxie software installer.

4. Install the 900-LC Series HPLC Online Help.

   The 900-LC Series HPLC Online Help CD is a separate CD to the driver CD but will be requested by the driver CD during installation.

5. Configure the 900-LC Series HPLC system(s) on the acquisition server.

Steps 1-2 are performed using the Galaxie CD.

Steps 3-5 are performed using the 900-LC Series driver setup wizard CD and the Online Help CD.

Note Before installation you must have the HPLC system set up and turned on. Set up includes having the network cabling and hardware plugged in.

The 900-LC Series HPLC is an Ethernet device and must be assigned an IP address. Contact your IT department to determine if you will be setting up the instrument as a dynamic or static IP and if you will be setting up a client/server system or a standalone system.

Note The IP address of the 900-LC Series HPLC system must be on the same subnet as the acquisition server or stand-alone PC. In addition, the HPLC systems must be connected to the provided Ethernet switch.

Note Disable the Windows® firewall on the PC(s) to be used with Galaxie software. This will help prevent installation and data collection problems.

Prior to installation check the following:

- Check that power management of your Ethernet network card is set to never allow the card to be turned off. Consult your PC manual for instructions.
- In the Windows® Control Panel > Display > Screen Saver set the power scheme for your monitor and hard drive to Never.
- Turn off the screen saver.
- Turn the Windows® XP Pro SP2 firewall off.
- Disable any virus scans.
- Turn off Automatic Updates in the Windows® Control Panel.

2.2.4.1 Installing the Galaxie CDS Core Software

To install the Galaxie™ CDS core software:

1. Please see the Galaxie Chromatography Data System Installation Guide, p/n 03-914948-02 for installation instructions.

Note The 900-LC Series HPLC Driver requires Galaxie™ software version 1.9 SP1 or greater.

During the Galaxie software and Galaxie Configuration Manager is installation a default profile is created. The user name, admin, and password, galaxie, can be used to log into Galaxie Configuration

Manager to set up users, systems and permissions and into the Galaxie software to run the system. This user name and password can be changed in Galaxie Configuration Manager.

2.2.4.2 Installing Galaxie or Other HPLC or GC Device Drivers

The drivers work with the Galaxie core software to provide instrument control and data acquisition. These instructions will provide information to install drivers other than the 900-LC Series HPLC driver. Go to the next section, Installing the 900-LC Series HPLC Driver, if this procedure is not required.

To install Galaxie or other HPLC or GC device drivers:

1. Please see the Galaxie Chromatography Data System Installation Guide, p/n 03-914948-02 for installation instructions.

2.2.5 Installing the 900-LC Series HPLC Driver

The drivers work with the Galaxie core software to provide instrument control and data acquisition. Install this driver on the main server and each acquisition server and client PC that will be working with the 900-LC Series HPLC system.

Note If you have purchased the single system Galaxie software license, open Galaxie Configuration Manager and delete the Default system that is created during the Galaxie software installation. For information on how to delete a system please see section 2.2.8, Deleting a System, page 31.

Note Before installation you must have the HPLC system set up and turned on. Set up includes having the network cabling and hardware plugged in.

To install the 900-LC Series HPLC Driver:

1. Insert the 900-LC Series Galaxie Driver CD into your CD-ROM drive. The software will automatically start[1].
2. Click **Next** on the Welcome to Install Shield Wizard for Varian Series 900-LC Drivers window.
3. Click **Yes** to accept to the License agreement. Clicking no will terminate the program.

[1] If you have turned off the auto-start capability of your CD-ROM drive, you will need to run the setup.exe file on the CD-ROM.

4. Enter in your name, the company name, and the serial number of the 900-LC Series HPLC Driver CD (p/n 8510244200) or the serial number from the Galaxie Control Software for Varian HPLC Systems CD (p/n 0395000491). The serial number is provided on your Varian HPLC driver's serial number card or Galaxie software CD and is different from the Galaxie serial number.
5. For installations of the new Varian 900-LC Driver with an existing Galaxie Varian HPLC driver only: If you need to look up existing serial number in the Galaxie software first login to the Galaxie Configuration Manager then select the "options" menu and then select the option "Licenses"...

The installer begins to install the driver files onto the PC.

6. Click **Yes** to install the Flash Player.

Note If you click No, you will not get the full functionality of the 900-LC Series HPLC driver; however, Flash is not required to run the 900-LC.

7. Click **Close** on the Flash Player 9 Installer Setup: Completed window to continue the installation.
8. Click **Next** on the Welcome to Microsoft™ .NET Framework 2.0 Setup window.
9. Read and then accept the terms of the License Agreement and then click **Install** on the End-User License Agreement window.
10. Click Finish to complete the Microsoft™ .NET Framework 2.0 installation. This process can take several minutes.
11. Click **Yes** to install Adobe Acrobat Reader.

Note If you click No, installing Adobe Acrobat Reader will be skipped. However, you may not be able to view any accompanying PDF report files or help files.

If you click Yes and the Repair/Modify window appears, Adobe Acrobat Reader is already installed on your PC. Click Cancel to stop the Adobe Acrobat Reader installation or click Repair to re-install.

12. Click **Next** on the Destination Folder window.
13. Click **Install** on the Ready to Install the Program window.
14. Click **Finish** to complete the Adobe Acrobat Reader installation.

2.2.6 Installing the 900-LC Series HPLC Help

This step is a continuation from the previous section, Installing the 900-LC Series HPLC Driver.

To install the 900-LC Series HPLC Help:

1. Remove the driver CD and insert the 900-LC Series HPLC Help CD when instructed. Click **OK**. If you click Cancel, a message will appear confirming your choice not to install the Online Help. Click No to exit the installation or click Yes to continue installing the Online Help. If the CD Windows™ Explorer window appears, close it.
2. Click **OK** to continue the installation.
3. Click **Next** on the Welcome to the Varian 900-LC Series HPLC Help Setup Wizard window.

Note This window may be behind the 900-LC Series system configuration window. Do not close the 900-LC Series system configuration window. Move it out of the way until it is needed.

4. Click **OK** to accept the default installation location or choose a different location to install a shortcut to the Online Help.
5. Click on **Finished**.

2.2.7 Configuring the 900-LC Series HPLC System(s)

This step is a continuation from the previous section, Installing the 900-LC Series HPLC Help.

To use this setup wizard after the installation process, access this setup program by navigating to C:\Galaxie\Server\Devices\SetupWizard.exe. Double click SetupWizard.exe to launch the setup program or please see the Galaxie Configuration Manager online help.

To access the Galaxie Configuration Manager Online Help:

Click the Windows® **Start** button and choose **Programs > Galaxie™ (Chromatography) > Help > Galaxie™ Configuration Manager**.

Systems should only be configured on an acquisition server or a stand-alone PC configuration.

Note This setup wizard will allow all Groups, Projects and Users defined in Galaxie Configuration Manager to access this system.

To configure the 900-LC Series HPLC System(s):

1. Click **Yes** to configure a system if you are installing on an Acquisition server or on a Stand-Alone system. If you choose No, the installer will exit.
2. The 900-LC Series Setup Wizard window appears. Enter in the name of the system. This is the system name that will be displayed in the browser window of the Galaxie software.

Note Ensure you have typed in the correct system name. To modify a system name later you must first delete that HPLC system, see page 31, and then use this SetupWizard.exe to recreate the HPLC system.

3. Click on the magnifying glass icon to start the system discovery process. This can take up to 5-10 seconds.
4. Click the down arrow button in the Instrument field to select the HPLC system.

Note Identify the system by the MAC address which can be found on the back of the HPLC system and in your documentation that came with the HPLC system.

Once the system is chosen, IP address information will be automatically entered into the IP address, Subnet mask, and Default gateway fields. This information will be what the instrument was shipped with and may not be appropriate for your use.

7. Choose **Obtain an IP address automatically (DHCP)** or **Use a static IP address**.
   (a) When Obtain IP address automatically (DHCP) is chosen, the system will search for an IP address automatically. If one is not found, click **Retry**. The Switching to DHCP mode window pops up. Click **Initialize instrument**. This will reboot the HPLC system communications card. Click **Close** when the initialization is complete.

Note If an IP address still does not appear, contact your IT department to check your network connections. The HPLC systems must be on the same gateway/subnet as the acquisition server or stand-alone PC configuration and be connected to the provided Ethernet switch.

   (b) When Use a static IP address is chosen, enter in the IP address, Subnet mask, and Default gateway for the HPLC system. The HPLC systems must be on the same gateway/subnet as the acquisition server or stand-alone PC configuration and be connected to the provided Ethernet switch.

8. Click **Create**.
9. Click **OK** when the message confirming the system creation comes up.
10. Create up to three more systems or click **Close** to exit the installer.
11. Click **Yes** or **No** to the question 'Do you want to give the right "Allow to run instrument maintenance software' to ALL of the Galaxie user profiles?'. This will provide access to the Instrument Maintenance Software (IMS) for all profiles. See page 35 for more information on IMS. For most unregulated installations click Yes.

Note To configure IMS access for individual profiles use Galaxie Configuration Manager.

12. If Yes was clicked in step 11, click **OK** at the All user profiles have been changed window.
13. Click **Finish** on the InstallShield Wizard Complete window.

2.2.8 Deleting a System

If the system needs to be renamed or the IP address changed you will need to delete the existing system and recreate it.

To delete a system:

1. Open Galaxie Configuration Manager.
2. Click the Windows® Start button and choose **Programs > Galaxie™ > Galaxie™ Configuration Manager**.
3. Log in to Galaxie Configuration Manager.
4. Click **Systems** in the upper left side of the window.
5. Right click the system to be deleted and choose **Delete**.
6. Click **Communication engine configuration** on the lower left side of the window.
7. Highlight the first line with the system name to be deleted and then click **Remove** on the upper right side of the window.
8. Click **Yes** to delete the hardware configuration.
9. Repeat the previous step for all entries prefaced with the system name to be deleted.

10. If your changes are not showing in Galaxie Configuration Manager, press F5 on your keyboard or **View** and then **Refresh** to refresh the window.
11. Click **Interface configuration** on the bottom left side of the window.
12. Highlight the first line with the system name to be deleted and then click **Remove** on the upper right side of the window.
13. Repeat the previous step for all entries prefaced with the system name to be deleted.
14. Click **Apply**.
15. Exit Galaxie Configuration Manager.

2.2.9 Change the 900-LC Series HPLC System Name or IP Address

You cannot change the name or IP address of an HPLC system. You must delete the system first and then re-create it using the SetupWizard.exe.

To change the name or IP address of a system:

1. Delete the HPLC system. See section 2.2.8 for instructions.
2. Re-create the HPLC system. See section 2.2.7 for instructions.

2.2.10 Update Galaxie to Version 1.9 SP1

The 900-LC Series HPLC Driver requires Galaxie version 1.9 SP1 to run. The ordering information for the CD is part number 03-950000-98 (Galaxie Software Service Pack 1 (SP1) CD). This CD is only available for Galaxie software version 1.9.

Note Contact your local Varian representative to upgrade Galaxie version 1.8 to 1.9 SP1. This CD will not update Galaxie version 1.8 to 1.9 SP1.

To update to version 1.9 SP1:

1. Insert the CD into your CD-ROM drive.
2. Click Next on the Welcome screen.

The updater will install and update the required files.

3. Click Yes to restart your PC.

4. Click Finish to restart the PC.

When the restart has completed a window will appear asking for the Main server name if you are performing a Client/Server installation.

5. Enter the main server name into the field.

Note You must update all PC's in the Galaxie network. Always update the main server first.

Hot Tip To familiarize yourself with the Galaxie™ software, after installation, click the Windows® **Start** button and choose **Programs > Galaxie™ > Galaxie™ Help**.

2.3 About the Varian 900-LC Series HPLC Online Help

Throughout this manual references are made to the Varian 900-LC Series HPLC online help or Galaxie™ Chromatography Data Systems help.

The Varian HPLC system online help is provided on a separate CD to the Galaxie™ software and is installed on your PC during the Galaxie™ software installation.

The HPLC system help includes information and instructions on:

- Safety
- HPLC system standard and optional hardware
- Installation of the HPLC system options and components including the:
  - Hardware
  - HPLC system driver for the Galaxie™ software
- Creating methods
- Viewing run details
- Saving the run
- Maintenance
- Troubleshooting
- Spares and options

2.4 Hardware Installation

Your HPLC system will be ready to operate after the Varian representative has installed it. However, over time you may need to replace some hardware components such as detector lamps, autosampler needles, etc or may need to install a new device to

your HPLC system. For instructions on how to do this, please refer to the online help. Specifically:

1. Click the Windows® **Start** button and choose **Programs > Galaxie™ > Help > Varian 900-LC Series HPLC Help**.
2. When the Online Help appears, click the **How to > Installing Components** link to access step-by-step instructions on how to remove and install the various instrument components.

For information on your instrument connections including connecting the network and communication cables please refer to the online help.

1. Click the Windows® **Start** button and choose **Programs > Galaxie™ > Help > Varian 900-LC Series HPLC Help**.
2. When the Online Help appears, click **About Your Instrument** link to access information about the front, side and back connections and components of your HPLC system.

2.5 Installation System Test

Your Varian representative will perform a system test during the installation procedure.

You can find the results of the system test in the Log Book. The Log Book is a list of all actions, counters and tests performed on your HPLC system. The saved file can be found in your My Documents folder on the PC the system test was performed, or in the Log Book tab in the IMS software. It is recommended you save those results as a record of your instrument performance at installation.

If you purchased a separate AIQ package, please refer to the documentation provided with the AIQ package for more information.

2.6 Customer Training

During the installation process you will receive basic training on how to:

- set up the hardware
- use the Galaxie™ software
- use the Online Help
- use the IMS software.

2.7 Using the Varian 900-LC Series HPLC Online Help

The online help is context sensitive. Pressing the F1 key on any screen in the device control section of the Galaxie™ software will bring up help that relates to that screen.

Alternatively, you can access the online help by:

1. Click the Windows® **Start** button.
2. Click **Programs.**
3. Click **Galaxie™.**
4. Click **Help.**
5. Click **Varian 900-LC Series HPLC Help.**

2.8 Instrument Maintenance Software (IMS)

IMS software is used to keep track of any maintenance performed on the HPLC system and usage over time of components within each device in your HPLC system.

IMS has several features:

- Counters which record component usage
- Actions which lists all procedures that can be tracked
- The Log Book lists all actions and counter information and can be saved in a PDF file
- Service tests which can test the performance of devices in the HPLC system.

2.8.1 How to Access IMS

Access the Instrument Maintenance Software from the link on the right side of the Status Overview window in the Galaxie™ software. The Instrument Maintenance software can be run with the Galaxie™ version 1.9 SP1 or greater. When the logon window appears, enter a User identification, and choose the group and project in which the system to be maintained is defined in Galaxie. Type the corresponding password. The password is case sensitive (abc ≠ ABC).

To be able to log into the Instrument Maintenance Software, 'allow to run instrument maintenance software' must be checked in the Acquisition/system properties part of the user profile in the Galaxie Configuration Manager software. If the user does not have the right to run maintenance software an error message is displayed.

To enable IMS access:

1. Open and log in to the Galaxie Configuration Manager software.
2. Click **User profiles**.
3. Right click on the user profile to be edited and choose **Edit**.
4. Click **Next**.
5. Click the + sign next to Acquisitions/System properties to expand the list.
6. Select **Allow to run instrument maintenance software** and any other tasks required by the user.
7. Click **OK** to save the changes.

2.8.2 About IMS

The software has the menu bar at the top which includes:

- File
  - Open Audit trail
  - Save Audit trail
  - Preview Audit trail
  - Print Audit trail
  - Quit
- View
- Actions
  - Maintenance mode ON
  - Maintenance mode OFF
- About

For detailed information about the IMS software please see the 900-LC Series HPLC online help.

To access the online help:

1. Click the Windows® **Start** button.
2. Click **Programs.**
3. Click **Galaxie™.**
4. Click **Help.**

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5. Click **Varian 900-LC Series HPLC Help.**
6. Click **Instrument Maintenance Software** in the online help table of contents.

For information on audit trails:

1. Click the Windows® **Start** button.
2. Click **Programs.**
3. Click **Galaxie™.**
4. Click **Help.**
5. Click **Varian 900-LC Series HPLC Help.**
6. Click the plus sign next to **Instrument Maintenance Software** in the online help table of contents.
7. Click **Audit Trails**.

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3. Operation

You will find step-by-step instructions for common operations in the 900-LC Series HPLC Help. To access this information:

1. Select the Windows® **Start** button and choose **Programs > Galaxie™ > Help > Varian 900-LC Series HPLC Help**.
2. When the Online Help appears, click the **How to** link to view the available step-by-step instructions.

Below is a quick guide to getting the instrument set up and running samples.

3.1 Analysis Checklist

You need to complete the following steps in turn to measure a sample/s. You will find details on each step in this chapter.

- Turn on the instrument and software
- Prepare the instrument for use
- Configure the Device Settings and System Parameters
- Create a method
- Run samples
- View or Print a report

3.2 Turning on the Instrument and Software

Before starting the system, carefully read the Safety practices and hazards section at the front of this manual and ensure that the laboratory is set up according to the details specified in the Pre-installation manual.

To turn on the instrument and software:

1. Switch on the computer, monitor and printer.
2. Turn on the HPLC system.

3. To start the Galaxie™ software, click the Windows® **Start** button and then choose **Programs > Galaxie™ > Galaxie™**.

4. Enter in your login details and click **OK**.

3.2.1 Connecting to a System

Depending on the configuration you purchased, you may have up to four HPLC systems connected to one PC. Due to this flexibility in the software, you must connect to a system when you open the Galaxie™ program.

To connect to a system:

1. Click the **Systems** tab at the bottom left of the main Galaxie™ window.

2. Select the empty box next to your system.

Your Galaxie™ software will automatically begin communicating with your HPLC system.

Note There will be a delay between choosing your system and the system information appearing on your screen. The Galaxie™ software is communicating with the HPLC system.

3.3 Preparing the System for Use

For consistent and reproducible results each time you use the 900-LC Series HPLC it is recommended that you follow this procedure to prepare your system to run samples.

To prepare the system for use:

1. Check that all tubing to the column(s), pumps, and waste is correctly connected and in the proper position.

2. Place all samples into the autosampler tray. Cool the tray prior to placing samples into it if necessary.

3. Close the HPLC system doors.

4. Check that all tubes are placed in the fraction collector (if necessary).

5. Set the flow rate manually to remove any air bubbles or old solvent from the system.

6. Purge the pumps if new solvent is being used.

7. Purge any air bubbles from the autosampler injection valve if necessary.
8. Turn on the column heater and allow the column(s) to come to the correct temperature if necessary.

Caution It is imperative that whenever the column heater is turned on, the pump should be running with a non-absorbing solvent flowing through the column to avoid column degradation.

9. Turn the detector lamp(s) on.

Caution It is imperative that whenever the Varian detector lamp is turned on, the pump should be running with a non-absorbing solvent flowing through the cell, with no air bubbles present.

For more information on getting your system prepared for use please see the 900-LC Series HPLC Help.

1. Click the Windows® **Start** button.
2. Click **Programs.**
3. Click **Galaxie™.**
4. Click **Help.**
5. Click **Varian 900-LC Series HPLC Help.**
6. Click the plus sign next to How To….
7. Click **Prepare the HPLC System For Use**.

3.4 Configuring the Device Settings and System Parameters

The Device Settings allow you to program settings for each component within your 900-LC Series HPLC as well as control flow rates, purge the pumps, turn the detector lamps on, heat the column oven and move the autosampler needle and fraction collector probe.

The System Parameters are settings that will download directly to your method. They include information such as the pressure units

to be displayed on screen, autosampler rack size, fraction collector rack sizes, leak detection actions, pump head size, sample loop size, and enabling the cooling on the autosampler trays.

For additional information on your system components please see the 900-LC Series HPLC Online Help.

3.4.1 Flows

In Flows you can:

- manually set and turn on your flow rate and solvent composition
- purge the pumps
- set the bottle management parameters
- select the solvents for the Scale Up Module valves (if present in your system)

3.4.2 Detectors

Depending on the detector you purchased, in the detector Device Settings you can:

- choose wavelengths
- autozero the detectors
- turn your detector lamp(s) on
- choose the data collection parameters
- set the detector temperature conditions.

3.4.3 Column

Depending on the column options you purchased you can:

- set the column heater temperature
- turn the heater on
- choose the scale up module column
- choose between two columns if a column switching valve is present
- view the column properties of your column if you have downloaded your method to the HPLC system.

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3.4.4 Sample Introduction

Sample introduction can occur by using an autosampler or manual injector if you are running an analytical or analytical to semi-preparative HPLC. If you are running a preparative scale HPLC system samples are introduced using a manual injector or by a Thru Pump Injector.

Autosampler

If you purchased an analytical or analytical to semi preparative system you may have an autosampler.

In the Autosampler Device Settings you can move the needle to the:

- wash port
- injection port

You can also flush the syringe barrel to replace solvent or remove bubbles by clicking the Flush Syringe Barrel button.

If you have the cooling option on your autosampler you can change the temperature.

Manual Injector

Depending on the options you chose, you may have a manual injector. This allows you to make single injections. The Device Settings window lets you make an injection and shows you the state of the injector.

Injection Pump

The preparative scale HPLC system will have an injection pump. In the injection pump method you can program the injection volume and flow rate.

3.4.5 System Parameters

System Parameters are settings that affect new methods. If you change the System Parameters while a method is already open, the changes will not affect that method.

Depending on the system you purchased you can:

- set the units preferred for the pressure and set the cell ratio if using a semi-prep or prep cell
- edit the manual injector options including the reset time, analytical (SUM) loop size and preparative loop size
- edit the reset time for a manual injector which is used to switch the valve back into the idle position
- enable the rack cooling option in the autosampler section

- select normalization for the PDA detector
- set the option to turn the lamps on as the detector(s) power up
- choose synchronize with other modules send a contact closure to external devices
- choose which leak detector action will be performed when a leak is detected
- choose solvents to be used in the valve module section if you have a Scale Up Module
- with semi-prep and prep systems you can choose the pump head sizes, sample delivery pump head size and pressure units
- in the fraction collector section you must choose your rack type, tube volume and probe depth
- save your settings

3.5 Creating a Method

To create a new method:

1. Click **File > New > Method** in the upper left corner of the Galaxie™ software.
2. Choose the Project Name and System name from the drop-down menus and then click **Next**.
3. Enter the Method Name and Description and then click **OK**.

Note Galaxie™ will open to the main method screen on the Integration Events tab.

4. In the lower left corner click on **control**.

Note The Galaxie™ software will show the Device Select window. You should see a list of your system components just to the left of the Device Select window.

5. Choose the devices needed for your run by selecting or deselecting the options in the Device Select window.
6. On each device window set your parameters.

Note Your System Parameters will automatically appear in your method. All other settings will need to be checked.

7. Click **acquisition** in the lower left corner of the Galaxie™ software.

8. Click on the button with the three dots next to the File prefix field to open up variable options for your run name. Double click the variables to be used in your run name or type in a name for your run and then click **OK**.
9. Set the identifier number if something other than 1 is required to name the run.
10. In the Acquisition Parameters section enter in the Vial and Rack number if an autosampler is to be used, the Acquisition length and Injection Volume.

Note For information about the additional fields in the Acquisition window please see your Galaxie™ Chromatography Data System software Online Help.

1. Click **File > Save > Save Method**. The method will now be saved in the default data folder.

For more information on creating a method please see the 900-LC Series HPLC Help.

1. Click the Windows® **Start** button.
2. Click **Programs.**
3. Click **Galaxie™.**
4. Click **Help.**
5. Click **Varian 900-LC Series HPLC Help.**
6. Click the plus sign next to **Software**.
7. Click **Galaxie software tutorial** for a basic overview of the main Galaxie windows.
8. Alternatively, click the plus sign next to **How To…**
9. Click **Program a method from start to finish** for a step by step tutorial on how to program a method.

3.6 Starting an Acquisition

There are two ways to start an acquisition. You can have multiple injections by creating a sequence or single injections using Quick Start.

3.6.1 Sequence

1. From the **File** menu click **New > New Sequence**.
2. Choose the Project name and System name to be associated with this sequence and then click **Next**.
3. Enter the number of lines (number of samples) in the sequence and then click **Next**.
4. Enter the new sequence name and a description if needed and then click **OK**.

Note A window appears with the number of lines you chose in step 3. You can auto-fill the columns by entering or choosing a value in the first line and then right clicking the heading of that column. Choose **Fill Block** and then follow the prompts. Alternatively you can manually fill in each field to customize your sequence.

1. Enter in all required fields.
2. Click **File > Save > Save Sequence**.
3. On the Sequence page, click the green arrow button to start the sequence.
4. To view your runs click the **Systems** tab on the bottom left of the Galaxie™ software.

Note For further information about starting an acquisition and interpreting the results, refer to the Galaxie™ Chromatography Data System Online Help.

3.6.2 Quick Start

To start a Quick Start run:

1. Click **Acquisition** on the top menu bar.
2. Choose **Quick Start**.
3. Select the Project name, System name and Method name and then click **OK**.
4. Click on the button with the three dots next to the File prefix field to open up variable options for your run name. Double click the variables to be used in your run name or type in a name for your run and then click **OK**.

5. Set the identifier number if something other than 1 is required to name the run.
6. In the Acquisition Parameters section enter in the Vial and Rack number if an autosampler is to be used, the Acquisition length and Injection Volume.
7. Click the **Start** button.
8. To view your run click the **Systems** tab on the bottom left of the Galaxie™ software.

Note For further information about running samples and interpreting the results, refer to the Galaxie™ Chromatography Data System Online Help.

3.7 Printing a report

To print a report:

1. Click **Report Style** in the lower left corner of the Galaxie™ software.

Note When printing a report, you can simply select **Print** from the **File** menu. However, if you do so, a report will be generated based upon the last used Report Settings. You will not be able to select the data to be included in the printout.

2. Choose a report style or edit a style.

Note For more information on how to edit report styles please see the Galaxie™ Chromatography Data System Online Help.

3. Click File > **Print** to generate a report as specified.
4. The Print dialog box will open. You can select to print all of the report, or a range of pages. Reports are printed to your default printer, unless you specify otherwise. You can specify your printer options in the Print Setup dialog box, accessible from the **File** menu.

As the Print dialog is a standard Windows® dialog, you can obtain “What’s this” help on an item by clicking the question mark icon in the top right corner and then clicking the item of interest.

3.8 Saving Your Files

There are two ways to save a file.

- Save a file with the same name (overwriting the previous one) by using the menu **File > Save / Save** file type
- Save the file with another name by using the menu **File > Save As / Save** file type **As**.

In both cases, the Galaxie™ Software prompts as default to save the file type corresponding to the active file.

The Save file window displays the list of the files already created in the directory associated with the group (when the user is logged on to All projects) or with the project (when the user is logged on to a specific project).

Access the sub-directories by double-clicking on the corresponding folder icon. Once inside the sub-directory, the path is displayed at the top of the window.

4. Maintenance

This chapter includes information on how to access the Varian 900-LC Series HPLC system maintenance requirements that may be carried out by an operator. Any maintenance procedures not specifically mentioned should be carried out only by Varian-trained, Varian-qualified or Varian-authorized representatives.

Warning
The UV-Vis, PDA and Fluorescence detector lamps are intense light sources. Direct viewing of the light source will cause eye damage. Operators and other unauthorized personnel must NEVER remove the main covers.

Warning
This instrument contains electrical circuits, devices and components operating at dangerous voltages. Contact with these circuits, devices and components can result in death, cause serious injury, or painful electrical shock.

Warning
Allow hot parts to cool before proceeding with any maintenance procedure.

Warning
There is a danger of ignition when using flammable chemicals such as organic solvent. Aqueous solvents or organic solvents having an ignition point above 70 °C can be used. Do not use organic solvents having an ignition point below 70 °C.

Be careful about ignition due to static electricity when using flammable chemicals. Use a conductive vessel and carry out grounding correctly, especially when using a non-conductive chemical. This instrument is not explosion-proof.

Warning
Always check the flow path for leakage of solvent or waste solution during use and leakage of solvent inside the instrument. If an abnormality is found, stop the operation immediately.

Provide sufficient ventilation in the room.

Use of the HPLC system and accessories may involve materials, solvents and solutions which are flammable, corrosive, toxic or otherwise hazardous. Careless, improper or unskilled use of such materials, solvents and solutions can create explosion hazards, fire hazards, toxicity and other hazards that can result in death, serious personal injury or damage to equipment.

Note This section refers only to maintenance procedures for the instrument. You should refer to your PC and printer manuals for their maintenance procedures and to the 900-LC Series HPLC Help for the maintenance procedures for any accessories you ordered.

4.1 Routine Maintenance

Routine maintenance information is provided in the 900-LC Series HPLC online help. To access these instructions:

1. Click the Windows® **Start** button.
2. Click **Programs**.
3. Click **Galaxie™.**

4. Click **Help.**
5. Click **Varian 900-LC Series HPLC Help**.
6. Click the **Maintenance** link.
7. Click **Checklist**.

4.2 Cleaning

Any spills in the sample compartment or on the HPLC system should be wiped up immediately.

The exterior surfaces of the instrument should be kept clean. All cleaning should be done with a soft cloth. If necessary, this cloth can be dampened with water or a mild detergent. Do not use organic solvents or abrasive cleaning agents.

4.3 Spare Parts

For spare parts and consumables ordering information, refer to the Varian, Inc. Web site:

www.varianinc.com

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5. Troubleshooting

For troubleshooting help please refer to the Varian 900-LC Series HPLC online help.

To access the online help troubleshooting section:

1. Click the Windows® **Start** button.
2. Click **Programs**.
3. Click **Galaxie™.**
4. Click **Help.**
5. Click **Varian 900-LC Series HPLC Help**.
6. Click the **Troubleshooting** link for general HPLC system troubleshooting or click the plus sign next to Troubleshooting to access the device troubleshooting information.

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